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RANDOMIZED COMPARISON OF VASCULAR HEALING RESPONSE BETWEEN SELF-EXPANDING NITINOL STENT AND SELF-EXPANDING PACLITAXEL-ELUTING STENT IN THE SUPERFICIAL FEMORAL ARTERY: AN OPTICAL FREQUENCY DOMAIN IMAGING STUDY

Poster Contributions
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Authors: *Kojiro Miki, Kenichi Fujii, Masashi Fukunaga, Takahiro Imanaka, Hiroto Tamaru, Akinori Sumiyoshi, Tetsuo Horimatsu, Machiko Nishimura, Ten Saita, Masahiko Shibuya, Tohru Masuyama, Masaharu Ishihara, Hyogo College of Medicine, Nishinomiya, Japan*

Background: Similar to the coronary artery, late stent thrombosis (ST) due to delayed vascular healing is concerned after drug-eluting stent (DES) implantation in the superficial femoral artery (SFA). Therefore, we analyzed vascular response after DES implantation in the SFA with optical frequency domain imaging (OFDI).

Methods: Consecutive 28 de novo SFA lesions from 24 patients underwent endovascular therapy (EVT) were randomly assigned 1:1 to receive self-expanding bare-metal nitinol stent (BMS, 15 lesions) or self-expanding paclitaxel-eluting nitinol stent (PES, 13 lesions) implantation. Six months after initial EVT, follow-up angiography and OFDI examination were conducted to evaluate the vascular response to the stents. OFDI analyses were performed at 5-mm axial intervals throughout entire stented segments. Neointimal tissue (NIT) thickness inside all stent struts was measured. In the morphological OFDI analysis, the presence of thrombus, microvessels, peri-strut low intensity area (PLIA), and the optical appearance of NIT were analyzed. The optical appearance of NIT was classified into 3 patterns: homogeneous, layered, and heterogeneous patterns. The primary end-point was the percentage of uncovered stent strut at 6-month follow-up.

Results: The mean lesion length was 75±45 mm. During follow-up period, 3 patients died and 2 lesions were performed revascularization for restenoses of target lesions. Finally, follow-up angiography and OFDI were performed in 23 lesions and 9615 stent struts were analyzed. The binary angiographic restenosis rate at 6-month follow-up was 15.4% in BMS group and 10% in PES group (P>0.99). The percentage of uncovered strut was higher in PES group compared to BMS group (13.4% vs. 4.1%, P<0.0001). Mean NIT thickness was smaller in PES group (418±46 μm vs. 661±62 μm, P<0.01). Prevalence of thrombus, microvessels, and PLIA were similar between two groups. Also, there was no significant difference in the optical appearance of NIT.

Conclusion: OFDI revealed that vascular healing after DES implantation in the SFA was impaired at chronic phase. An adjunctive therapy might be required for prevention of ST after DES implantation.